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|-------------------------------|------------------------|------------------------|--|
| Notice of Allowability | Application No. | Applicant(s) | |
| | 10/081,090 | NAJMUDDIN, ILYAS JUZER | |
| | Examiner | Art Unit | |
| | Victor J. Taylor | 2863 | |

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address--

All claims being allowable, PROSECUTION ON THE MERITS IS (OR REMAINS) CLOSED in this application. If not included herewith (or previously mailed), a Notice of Allowance (PTOL-85) or other appropriate communication will be mailed in due course. **THIS NOTICE OF ALLOWABILITY IS NOT A GRANT OF PATENT RIGHTS.** This application is subject to withdrawal from issue at the initiative of the Office or upon petition by the applicant. See 37 CFR 1.313 and MPEP 1308.

1. ☒ This communication is responsive to July 12 2004.
2. ☒ The allowed claim(s) is/are 1, 5, 9 and 13-26.
3. ☐ The drawings filed on _____ are accepted by the Examiner.
4. ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
 - a) ☐ All b) ☐ Some* c) ☐ None of the:
 1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this national stage application from the International Bureau (PCT Rule 17.2(a)).

* Certified copies not received: _____.

Applicant has THREE MONTHS FROM THE "MAILING DATE" of this communication to file a reply complying with the requirements noted below. Failure to timely comply will result in ABANDONMENT of this application.
THIS THREE-MONTH PERIOD IS NOT EXTENDABLE.

5. ☐ A SUBSTITUTE OATH OR DECLARATION must be submitted. Note the attached EXAMINER'S AMENDMENT or NOTICE OF INFORMAL PATENT APPLICATION (PTO-152) which gives reason(s) why the oath or declaration is deficient.
 6. ☒ CORRECTED DRAWINGS (as "replacement sheets") must be submitted.
 - (a) ☒ including changes required by the Notice of Draftsperson's Patent Drawing Review (PTO-948) attached
 - 1) ☐ hereto or 2) ☒ to Paper No./Mail Date 4/05/2004.
 - (b) ☐ including changes required by the attached Examiner's Amendment / Comment or in the Office action of Paper No./Mail Date _____.
- Identifying indicia such as the application number (see 37 CFR 1.84(c)) should be written on the drawings in the front (not the back) of each sheet. Replacement sheet(s) should be labeled as such in the header according to 37 CFR 1.121(d).
7. ☐ DEPOSIT OF and/or INFORMATION about the deposit of BIOLOGICAL MATERIAL must be submitted. Note the attached Examiner's comment regarding REQUIREMENT FOR THE DEPOSIT OF BIOLOGICAL MATERIAL.

Attachment(s)

- | | |
|--|--|
| 1. <input type="checkbox"/> Notice of References Cited (PTO-892) | 5. <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 2. <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 6. <input type="checkbox"/> Interview Summary (PTO-413), Paper No./Mail Date _____. |
| 3. <input checked="" type="checkbox"/> Information Disclosure Statements (PTO-1449 or PTO/SB/08), Paper No./Mail Date <u>16</u> | 7. <input type="checkbox"/> Examiner's Amendment/Comment |
| 4. <input type="checkbox"/> Examiner's Comment Regarding Requirement for Deposit of Biological Material | 8. <input checked="" type="checkbox"/> Examiner's Statement of Reasons for Allowance |
| | 9. <input type="checkbox"/> Other _____. |

DETAILED ACTION

Drawings

1. The drawings are objected to because the corrected drawings submitted on July 12, 2004 are incomplete. The submission of the new corrected drawings on July 12, 2004 are missing figure 9, and the drawing for figure 10 and figure 11 are not numbered with the correct page numbers. In addition figure 10 and 11 are of poor quality and are dark copy images of and appear to be copies for an overhead template with large blacked out squares. Figure 11 is improperly numbered with hand drawn circle and has a dark and misaligned center figure.

The drafts person on UPTO form 948 of December 9, 2003 and 22 February 2002 rejected and objected to the drawings in the office action of 4/05/2004.

These corrected drawings submitted on 12 July 2004 are still not in compliance with the rejections as found on the USPTO 948 forms and compliance is required.

The applicant is required to submit new drawing corrections with correctly numbered pages that are compliant with the USPTO form 948 rejections of 22 February 2002, and 9 December 2003 under 37 CFR 1.84.

Corrected drawing sheets in compliance with 37 CFR 1.121(d) are required in reply to the Office action to avoid abandonment of the application. Any amended replacement-drawing sheet should include all of the figures appearing on the immediate prior version of the sheet, even if only one figure is being amended. The figure or figure number of an amended drawing should not be labeled as "amended." If a drawing figure is to be canceled, the appropriate figure must be removed from the replacement sheet,

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and where necessary, the remaining figures must be renumbered and appropriate changes made to the brief description of the several views of the drawings for consistency. Additional replacement sheets may be necessary to show the renumbering of the remaining figures. The replacement sheet(s) should be labeled "Replacement Sheet" in the page header (as per 37 CFR 1.84(c)) so as not to obstruct any portion of the drawing figures. If the examiner does not accept the changes, the applicant will be notified and informed of any required corrective action in the next Office action. The objection to the drawings will not be held in abeyance.

Response to Amendment

2. The Petition filed on 12 July 2004 was granted on 07 September 2004 and the RCE filed on 12 July 2004 including the third amendment to the application has been entered in the image file. The applicant has amended claims 1, 5, and 9 and added new claims 19-26 in the instant application. The applicant canceled claims 2-4, 6-8, and 10-12. Independent claims 1, 5, and 9 were previously allowed. The drafts person has previously rejected the replacement drawings that were submitted by the applicant on 16 March 2004 and in paper 7 on 9 December 2003.

Prior Art

3. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

I. Art A of Partyka et al., US 6,131,071 in class 702/016 is cited for the seismic spectral decomposition for seismic interpretation of processing seismic data to provide thin bed tuning effects of later rock discontinuities using source wavelets P1 and

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reflected wavelets R2 in figure 1-B for spectral decomposition in figure 6 at depth and applies the Gaussian weight function in figure 8 to determine the frequency components in line 2 of column 12.

II. Art B of Sudhakar et al., US 6,055,482 in class 702/016 is cited for the method of seismic signal processing and seismic analysis for identifying subterranean features using a coherence analysis to produce an earth model and determine the litho structure 27 in figure 1 and figure 5 and flattens the prestack migrated gather at the horizon of interest with the curves placed at the same horizontal level in lines 15-40 of column 10.

Allowable Subject Matter

4. Claims 1, 5, 9, 13-26 are allowed.

5. The following is an examiner's statement of reasons for allowance:

I. With regard to claim 1, the prior art of record does not disclose or suggest the claimed combination of method steps. Most particularly the claimed steps of "receiving a plurality of traces representative of the waves propagating through the fractured zone...[and] a first portion of the seismic traces corresponding to a first window above the fracture zone...[and] a second portion of the seismic traces corresponds to a second window located below the fracture zone" or the particularly claimed steps involved with "generating a first and second frequency spectrum associated with the first and second portions corresponding to the first and second windows...[and] superimposing the first spectrum onto the second frequency spectrum...[and] generating a superimposed frequency spectrum...[and] defining from the superimposed

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frequency spectrum a high and low frequency to determine the plurality of amplitude values” or the particularly claimed steps in using “the plurality of signal amplitudes to define a (t) time attribute by subtracting the natural log of the ratio of Fa to Fb to derive and define the defined high frequency less the defined low frequency” ...[and] providing for the plotting of the time attribute and in this combination is not found in the cited art of record.

The prior Art A of Partyka et al., US 6,131,071 teaches the seismic spectral decomposition for seismic interpretation of processing seismic data to provide thin bed tuning effects of later rock discontinuities using source wavelets P1 and teaches reflected wavelets R2 in figure 1-B for spectral decomposition in figure 6 at depth and teaches the application of the Gaussian weight function in figure 8 to determine the frequency components in line 2 of column 12.

The prior art B of Sudhakar et al., US 6,055,482 teaches the method of seismic signal processing and provides seismic analysis for identifying the subterranean features using a coherence analysis to produce an earth model and teaches a method to determine the litho structure 27 in figure 1 and figure 5 and teaches flattening the prestack migrated gather at the horizon of interest with the seismic curves placed at the same horizontal level in lines 15-40 of column 10.

Therefore, the prior art Partyka et al., and The prior art of Sudhakar et al., in combination or alone does not teach the present limitation of the claimed combination limitation.

Claims 13-14 which are dependent on the allowed independent claim 1 are allowed at least for the reason cited above.

It is these limitations expressed in each of these claims and not found, taught, or suggested in the prior art of record, that makes these claims allowable over the prior art.

II. With regard to claim 5, the prior art of record does not disclose or suggest the claimed combination of system steps. Most particularly the claimed program storage device tangibility embodying a computer program to perform the following method steps as recited in claim 1 that of "receiving a plurality of traces representative of the waves propagating through the fractured zone...[and] a first portion of the seismic traces corresponding to a first window above the fracture zone...[and] a second portion of the seismic traces corresponds to a second window located below the fracture zone" or the particularly claimed steps involved with "generating a first and second frequency spectrum associated with the first and second portions corresponding to the first and second windows...[and] superimposing the first spectrum onto the second frequency spectrum...[and] generating a superimposed frequency spectrum...[and] defining from the superimposed frequency spectrum a high and low frequency to determine the plurality of amplitude values" or the particularly claimed steps in using "the plurality of signal amplitudes to define a (t) time attribute by subtracting the natural log of the ratio of F_a to F_b to derive and define the defined high frequency less the defined low frequency"...[and] providing for the plotting of the time attribute and in this combination is not found in the cited art of record.

The prior Art A of Partyka et al., US 6,131,071 teaches the seismic spectral decomposition for seismic interpretation of processing seismic data to provide thin bed tuning effects of later rock discontinuities using source wavelets P1 and teaches reflected wavelets R2 in figure 1-B for spectral decomposition in figure 6 at depth and teaches the application of the Gaussian weight function in figure 8 to determine the frequency components in line 2 of column 12.

The prior art B of Sudhakar et al., US 6,055,482 teaches the method of seismic signal processing and provides seismic analysis for identifying the subterranean features using a coherence analysis to produce an earth model and teaches a method to determine the litho structure 27 in figure 1 and figure 5 and teaches flattening the prestack migrated gather at the horizon of interest with the seismic curves placed at the same horizontal level in lines 15-40 of column 10.

Therefore, the prior art Partyka et al., and The prior art of Sudhakar et al., in combination or alone does not teach the present limitation of the claimed combination limitation.

Claims 15-16 which are dependent on the allowed independent claims 5 are allowed at least for the reason cited above.

It is these limitations expressed in each of these claims and not found, taught, or suggested in the prior art of record, that makes these claims allowable over the prior art.

III. With regard to claim 9, the prior art of record does not disclose or suggest the claimed apparatus adapted for detecting fractures comprising most particularly the claimed first means of "receiving a plurality of traces representative of the waves

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propagating through the fractured zone...[and] a first portion of the seismic traces corresponding to a first window above the fracture zone...[and] a second portion of the seismic traces corresponds to a second window located below the fracture zone” or the particularly claimed means involved with “generating a first and second frequency spectrum associated with the first and second portions corresponding to the first and second windows...[and] means of superimposing the first spectrum onto the second frequency spectrum...[and] means of generating a superimposed frequency spectrum...[and] means of defining from the superimposed frequency spectrum a high and low frequency to determine the plurality of amplitude values” or the particularly claimed means in using “the plurality of signal amplitudes to define a (t) time attribute by subtracting the natural log of the ratio of F_a to F_b to derive and define the defined high frequency less the defined low frequency”...[and] means of providing for the plotting of the time attribute and in this combination is not found in the cited art of record.

The prior Art A of Partyka et al., US 6,131,071 teaches the seismic spectral decomposition for seismic interpretation of processing seismic data to provide thin bed tuning effects of later rock discontinuities using source wavelets P1 and teaches reflected wavelets R2 in figure 1-B for spectral decomposition in figure 6 at depth and teaches the application of the Gaussian weight function in figure 8 to determine the frequency components in line 2 of column 12.

The prior art B of Sudhakar et al., US 6,055,482 teaches the method of seismic signal processing and provides seismic analysis for identifying the subterranean features using a coherence analysis to produce an earth model and teaches a method

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to determine the litho structure 27 in figure 1 and figure 5 and teaches flattening the prestack migrated gather at the horizon of interest with the seismic curves placed at the same horizontal level in lines 15-40 of column 10.

Therefore, the prior art Partyka et al., and The prior art of Sudhakar et al., in combination or alone does not teach the present limitation of the claimed combination limitation.

Claims 17-18 which are dependent on the allowed independent claim 9 are allowed at least for the reason cited above.

It is these limitations expressed in each of these claims and not found, taught, or suggested in the prior art of record, that makes these claims allowable over the prior art.

IV. With regard to claim 19, the prior art of record does not disclose or suggest the claimed combination of method steps. Most particularly the claimed steps of "generating a first and second frequency spectrum associated with the first and second portions corresponding to the first and second windows...[and] defining an amplitude Fa (high)...[and] an amplitude Fa (low)...[and] an amplitude Fb (high) of the second frequency spectrum at the defined high frequency, and an amplitude Fb (low) of the second frequency spectrum at the defined low frequency" or the particularly claimed steps in using "defining a t^* attribute by dividing the difference" or the particularly claimed steps in "mapping the t^* attribute" and in this combination is not found in the cited art of record.

The prior Art A of Partyka et al., US 6,131,071 teaches the seismic spectral decomposition for seismic interpretation of processing seismic data to provide thin bed

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tuning effects of later rock discontinuities using source wavelets P1 and teaches reflected wavelets R2 in figure 1-B for spectral decomposition in figure 6 at depth and teaches the application of the Gaussian weight function in figure 8 to determine the frequency components in line 2 of column 12.

The prior art B of Sudhakar et al., US 6,055,482 teaches the method of seismic signal processing and provides seismic analysis for identifying the subterranean features using a coherence analysis to produce an earth model and teaches a method to determine the litho structure 27 in figure 1 and figure 5 and teaches flattening the prestack migrated gather at the horizon of interest with the seismic curves placed at the same horizontal level in lines 15-40 of column 10.

Therefore, the prior art Partyka et al., and The prior art of Sudhakar et al., in combination or alone does not teach the present limitation of the claimed combination limitation.

Claims 20-26 which are dependent on the allowed independent claim 19 are allowed at least for the reason cited above.

It is these limitations expressed in each of these claims and not found, taught, or suggested in the prior art of record, that makes these claims allowable over the prior art.

6. Any comments considered necessary by applicant must be submitted no later than the payment of the issue fee and, to avoid processing delays, should preferably accompany the issue fee. Such submissions should be clearly labeled "Comments on Statement of Reasons for Allowance."

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Conclusion


7. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Victor J. Taylor whose telephone number is 517-272-2281. The examiner can normally be reached on 8:00 to 5:30 PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, John E. Barlow can be reached on 571-272-2863. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

VJT

December 12, 2004


John Barlow
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